

**AMENDMENTS TO THE CLAIMS**

1 1. – 4. (Canceled)

1 5. (Currently Amended) ~~A directory-enabled network element as recited in Claim 1,~~  
2 ~~further comprising~~ A directory-enabled network element, comprising:  
3 a directory enabling element installed in and executed by the network element,  
4 wherein the network element is any one of a packet router and a data switch  
5 capable of manipulating packets at any of Open System Interconnection (OSI)  
6 Layer 2 and 3, wherein the directory enabling element is configured to query,  
7 access, and update directory information that is managed by a directory  
8 service of a network that includes the network element, wherein the directory  
9 service is any one of a Lightweight Directory Access Protocol (LDAP)  
10 directory and an X.500 directory;  
11 an application programming interface coupled to the directory enabling element and  
12 configured to receive directory services requests from application programs  
13 and provide the directory services requests to the directory enabling element,  
14 wherein the application programs are hosted in the network element;  
15 a locator service coupled to the directory enabling element and accessible using the  
16 application programming interface and configured to enable the application  
17 programs to locate servers that provide the directory services in the network;  
18 and

19 a bind service in the directory enabling element and coupled to a security protocol  
20 and configured to bind an external application program to the security  
21 protocol.

1 6. (Currently Amended) A directory-enabled network element as recited in Claim 4, 5,  
2 further comprising a Unicode translation service configured to query, access, and  
3 update directory information that is encoded in a Unicode international character  
4 format.

1 7. (Currently Amended) ~~A directory-enabled network element as recited in Claim 1,~~  
2 ~~further comprising~~ A directory-enabled network element, comprising:  
3 a directory enabling element installed in and executed by the network element,  
4 wherein the network element is any one of a packet router and a data switch  
5 capable of manipulating packets at any of Open System Interconnection (OSI)  
6 Layer 2 and 3, wherein the directory enabling element is configured to query,  
7 access, and update directory information that is managed by a directory  
8 service of a network that includes the network element, wherein the directory  
9 service is any one of a Lightweight Directory Access Protocol (LDAP)  
10 directory and an X.500 directory;  
11 an application programming interface coupled to the directory enabling element and  
12 configured to receive directory services requests from application programs  
13 and provide the directory services requests to the directory enabling element,  
14 wherein the application programs are hosted in the network element;

15        a locator service coupled to the directory enabling element and accessible using the  
16        application programming interface and configured to enable the application  
17        programs to locate servers that provide the directory services in the network;  
18        and  
19        an event service coupled to the directory enabling element and configured to receive  
20        registration of an event and an associated responsive action from an  
21        application program, notify the application program when the event occurs,  
22        and execute the associated responsive action in response thereto.

1        8.        (Canceled)

1        9.        (Currently Amended) A directory-enabled network element as recited in Claim 1 ~~4~~ 5,  
2        further comprising a group policy interface coupled to the directory enabling element  
3        and configured to receive and update the directory service with one or more  
4        definitions of directory services policies that apply to groups of network devices in  
5        the network.

1        10.       (Currently Amended) A directory-enabled network element as recited in Claim 1 ~~4~~ 5,  
2        further comprising[[:]]  
3        ~~a bind service in the directory enabling element and coupled to an security protocol~~  
4        ~~and configured to bind an external application program to the security~~  
5        ~~protocol; and~~  
6        an event service coupled to the directory enabling element and accessible using the  
7        application programming interface and configured to receive registration of an

8 event and an associated responsive action from an application program, notify  
9 the application program when the event occurs, and execute the associated  
10 responsive action in response thereto.

1 11. (Canceled)

1 12. (Currently Amended) ~~A directory-enabled packet router as recited in Claim 11,~~  
2 ~~further~~ A directory-enabled packet router for a packet-switched network, comprising:  
3 a directory enabling element installed in and executed by the packet router, wherein  
4 the packet router is capable of manipulating packets at any of Open System  
5 Interconnection (OSI) Layer 2 and 3, wherein the directory enabling element  
6 is configured to query, access, and update directory information that is  
7 managed by a directory service of the packet-switched network, wherein the  
8 directory service is any one of a Lightweight Directory Access Protocol  
9 (LDAP) directory and an X.500 directory;  
10 a bind service in the directory enabling element and coupled to a security protocol  
11 and configured to bind an application program to the security protocol; and  
12 an event service coupled to the directory enabling element and accessible using the  
13 application programming interface and configured to receive registration of an  
14 event and an associated responsive action from an application program, notify  
15 the application program when the event occurs, and execute the associated  
16 responsive action in response thereto.

1 13. (Canceled)

1 14. (Currently Amended) ~~A directory-enabled network data switch as recited in Claim~~  
2 ~~13, further~~ A directory-enabled network data switch for a packet-switched network,  
3 comprising:  
4 a directory enabling element installed in and executed by the data switch, wherein the  
5 data switch is capable of manipulating packets at any of Open System  
6 Interconnection (OSI) Layer 2 and 3, wherein the directory enabling element  
7 is configured to query, access, and update directory information that is  
8 managed by a directory service of the packet-switched network, wherein the  
9 directory service is any one of a Lightweight Directory Access Protocol  
10 (LDAP) directory and an X.500 directory;  
11 a bind service in the directory enabling element and coupled to a security protocol  
12 and configured to bind an application program to the security protocol; and  
13 an event service coupled to the directory enabling element and accessible using the  
14 application programming interface and configured to receive registration of an  
15 event and an associated responsive action from an application program, notify  
16 the application program when the event occurs, and execute the associated  
17 responsive action in response thereto.

1 15. (Canceled)

1 16. (Previously Presented) A computer-readable medium carrying one or more sequences  
2 of instructions for using a directory-enabled network element, wherein execution of

3 the one or more sequences of instructions by one or more processors causes the one or  
4 more processors to perform the steps of:

5 creating and storing a directory enabling element installed in and executed by the  
6 network element, wherein the network element is any one of a packet router  
7 and a data switch capable of manipulating packets at any of Open System  
8 Interconnection (OSI) Layer 2 and 3, wherein the directory enabling element  
9 is configured to query, access, and update directory information that is  
10 managed by a directory service of a network that includes the network  
11 element, wherein the directory service is any one of a Lightweight Directory  
12 Access Protocol (LDAP) directory and an X.500 directory;

13 binding an application program to a security protocol;

14 creating an event and an associated responsive action that are associated with the  
15 application program; and

16 in response to occurrence of the event, executing the responsive action, obtaining  
17 policy information from the directory service, and converting the policy  
18 information into one or more commands that are executable by the directory-  
19 enabled network element.

- 1 17. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 locating a nearest directory server and binding the application program to the nearest  
5 directory server that is located;

6 locating a nearest event server and binding the application program to the nearest  
7 event server that is located.

1 18. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 translating the policy information into one or more values that are ready to apply to a  
5 router, whereby a virtual private network is created between the router and  
6 another network device.

1 19. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of:  
4 translating the policy information into one or more values that are ready to apply to a  
5 set of internal data structures of a router, by calling one or more internal NOS  
6 API functions, whereby a dynamic IPSEC configuration is created that  
7 connects the router and at least one other network device.

1 20. (Original) A computer-readable medium as recited in Claim 16, wherein execution of  
2 the one or more sequences of instructions by one or more processors causes the one  
3 or more processors to perform the further steps of establishing an application  
4 programming interface coupled to the directory enabling element and configured to  
5 receive directory services requests from application programs and provide the  
6 directory services requests to the one or more processors.

1 21. (Canceled)

1 22. (Canceled)

1 23. (Currently Amended) ~~The system of claim 22,~~ A system comprising a network  
2 element enabled to automatically interface with directory services in a network,  
3 wherein the network element comprises:  
4 a directory enabling element installed in and executed by the network element,  
5 wherein the network element is any one of a packet router and a data packet  
6 switch capable of manipulating packets at any of Open System  
7 Interconnection (OSI) Layer 2 and 3, wherein the directory enabling element  
8 is configured to query, access, and update directory information that is  
9 managed by directory services of the network that includes the network  
10 element, wherein the directory services include at least one of a Lightweight  
11 Directory Access Protocol (LDAP) directory and an X.500 directory; and  
12 a locator service coupled to the directory enabling element and configured to locate  
13 servers that provide the directory services in the network;  
14 wherein the network element obtains policy information from the directory services  
15 and updates the directory service.

1 24. (Currently Amended) The system of Claim ~~22~~ 23, wherein the network element  
2 includes a protocol agent for interfacing with the directory services.



1 25. (Canceled)

1 26. (Canceled)